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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/560,548

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Daniel Dreyer

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EXAMINER

RADEMAKER, CLAIRE L

ART UNIT

PAPER NUMBER

1795

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DELIVERY MODE

03/18/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/560,548	<b>Applicant(s)</b> DREYER ET AL.	
	<b>Examiner</b> CLAIRE L. RADEMAKER	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 26, 2009 has been entered. No claims have been amended.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on April 28, 2009.

### ***Claim Rejections - 35 USC § 103***

3. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Abbe et al. (US 3,159,507) in view of Zucker (WO 03/026038) on claims are withdrawn.

4. Claims 1-2, 8-16, 18-20, & 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zucker (WO 03/026038) in view of Abbe et al. (US 3,159,507).

With regard to claims 1-2, 8-16, & 18, Zucker teaches a separator material for forming a separator for a lead-acid accumulator / battery (page 1, paragraph 1), wherein the separator material comprises:

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A first layer in the form of a microporous sheet (3, page 6, paragraph 4), which can be made of a thermoplastic material such as polyethylene (page 6, paragraph 4 - page 7, paragraph 1) having a molecular weight of at least 300,000, a melt index under normal conditions of substantially 0 (zero), and a viscosity number of not less than 600ml/g (page 7, paragraph 1), wherein said polyethylene has a filler content of silica (page 7, paragraph 2), and where said first layer can have a number of protrusions / ribs, each defining an area of increased film thickness, on at least one face of a base sheet (page 11, paragraph 5 - page 12, line 2), where at least 50% of the pores of the first layer have a diameter of 0.5 $\mu$ m or less (page 10, paragraph 3), and where said first layer has a thickness of 0.02-0.3mm in areas without protrusions (page 11, paragraph 4 – page 12, paragraph 1); and

At least one second layer (2, page 6, paragraph 2) in the form of a planar fleece material which is located on a face of the microporous sheet (page 16, paragraph 2), where the second layer can substantially consist of glass fibers (page 12, paragraphs 2-3), can substantially consist of polyester fibers (page 12, paragraphs 2 & 4, & page 13, paragraph 1), or a mixture of glass fibers and polyester fibers (page 14, paragraph 2 & page 13, paragraph 1), where the at least one planar fleece layer can be bonded to the microporous sheet by ultrasonic welding / ultrasonic sealing (page 16, paragraph 2), and where the at least one planar fleece layer can have a thickness of 0.2-3.6mm (page 15, paragraph 3),

But fails to teach that the second layer is located on a face of the first layer / microporous sheet having such protrusions or that the second layer is located at least at

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the level of the surface of the first layer / base sheet in the area of the weld joints and does not penetrate into this.

Abbe et al. teaches a separator material for a battery (col. 1, lines 10-15), where said separator material for forming a separator comprises a first layer in the form of a microporous sheet (col. 2, lines 37-41 & 56-63 & col. 4, lines 10-27 & 48-52; Figure 7), which can be made of glass fibers and a synthetic resin of hydrophilic character (col. 5, lines 11-16) and can have a number of protrusions / ribs, each defining an area of increased film thickness, on at least one face of a base sheet (col. 4, lines 23-27 & col. 5, lines 7-10; Figure 7), and at least one second layer (col. 2, lines 37-41, col. 4, lines 10-12, & col. 5, lines 7-10; Figure 7) in the form of a planar fleece material which is located on a face of the microporous sheet (col. 4, lines 10-12 & col. 5, lines 7-10; Figure 7), wherein the planar fleece material is bonded to at least some of the protrusions / ribs via welded / fused joints on said protrusions / ribs (col. 4, lines 10-12 & col. 5, lines 7-10; Figure 7), and where the fleece material can be located at least at the level of the surface of the base sheet in the area of the welded / fused joints and does not penetrate into this (Figure 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of the second layer being located on a face of the first layer / microporous sheet having such protrusions where the second layer is located at least at the level of the surface of the first layer / base sheet in the area of the weld joints and does not penetrate into this of Abbe et al. to the separator of Zucker in order to create a separator which can meet different conditions, both from the standpoint of structure as

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well as from the standpoint of operation and gas liberation within the cell (col. 2, lines 45-49).

With regard to claim 19, Zucker teaches a process for the production of a separator material for a battery (page 1, paragraph 1 & page 15, paragraph 3 - page 17, paragraph 1) with the steps:

(a) provision of a microporous sheet having a number of protrusions / ribs, each defining an area of increased film thickness, on at least one face of a base sheet (page 6, paragraph 4 - page 7, paragraph 1, & page 11, paragraph 5 - page 12, line 2);

(b) provision of at least one second layer in the form of a planar fleece material (page 6, paragraph 2, page 16, paragraph 2);

(c) location of the at least one second layer on a face of the microporous sheet (page 16, paragraph 2); and

(d) bonding / welding / fusing the at least one planar fleece layer to the microporous sheet by ultrasonic welding / ultrasonic sealing (page 16, paragraph 2),

But fails to teach that the second layer is located on a face of the first layer / microporous sheet having such protrusions or that the second layer is located at least at the level of the surface of the first layer / base sheet in the area of the weld joints and does not penetrate into this.

Abbe et al. teaches a separator material for a battery (col. 1, lines 10-15), where said separator material for forming a separator comprises a first layer in the form of a microporous sheet (col. 2, lines 37-41 & 56-63 & col. 4, lines 10-27 & 48-52; Figure 7), which can be made of glass fibers and a synthetic resin of hydrophilic character (col. 5,

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lines 11-16) and can have a number of protrusions / ribs, each defining an area of increased film thickness, on at least one face of a base sheet (col. 4, lines 23-27 & col. 5, lines 7-10; Figure 7), and at least one second layer (col. 2, lines 37-41, col. 4, lines 10-12, & col. 5, lines 7-10; Figure 7) in the form of a planar fleece material which is located on a face of the microporous sheet (col. 4, lines 10-12 & col. 5, lines 7-10; Figure 7), wherein the planar fleece material is bonded to at least some of the protrusions / ribs via welded / fused joints on said protrusions / ribs (col. 4, lines 10-12 & col. 5, lines 7-10; Figure 7), and where the fleece material can be located at least at the level of the surface of the base sheet in the area of the welded / fused joints and does not penetrate into this (Figure 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of the second layer being located on a face of the first layer / microporous sheet having such protrusions where the second layer is located at least at the level of the surface of the first layer / base sheet in the area of the weld joints and does not penetrate into this of Abbe et al. to the separator of Zucker in order to create a separator which can meet different conditions, both from the standpoint of structure as well as from the standpoint of operation and gas liberation within the cell (col. 2, lines 45-49).

With regard to claim 20, Zucker teaches that the at least one planar fleece layer can be bonded / welded to the microporous sheet by ultrasonic welding / ultrasonic sealing (page 16, paragraph 2).

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With regard to claim 22, Zucker teaches that the at least one planar fleece layer can have a thickness of 0.2-3.6mm (page 15, paragraph 3).

5. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zucker (WO 03/026038) in view of Abbe et al. (US 3,159,507), as applied to claims 1-2 above, and further in view of Kawai et al. (US 3,210,218).

The disclosure of Zucker and Abbe et al. as discussed above is fully disclosed herein.

With regard to claims 3-4, modified Zucker fails to teach that the protrusions/ribs run vertically and extend over the entire length of the separator or that the separator comprises outermost ribs in each of the two side edge areas.

Kawai et al. teaches a battery separator (col. 1, lines 12-13; Figures 1-3) comprising a microporous sheet (2, col. 1, lines 62-70 & col. 4, lines 49-51) which has protrusions / ribs that run vertically and extend over the entire length of the microporous sheet (col. 1, lines 65-70; Figure 2), where said microporous sheet comprises outermost protrusions/ribs in each of the two side edge areas (Figure 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the design of the microporous sheet with protrusions / ribs of Kawai et al. to the microporous sheet with protrusions / ribs of modified Zucker in order to create a battery separator which has high mechanical strength (col. 1, lines 62-70 & col. 3, lines 40-45).



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With regard to claims 5-6, modified Zucker fails to teach that the outermost protrusions / ribs can comprise continuous or discontinuous welded joints.

While modified Zucker fails to teach that the outermost protrusions / ribs can comprise continuous or discontinuous welded joints, it would have been obvious to one of ordinary skill in the art that the welded joints could be made continuous in order to provide a better seal or could be made discontinuous in order to decrease manufacturing time and cost.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zucker (WO 03/026038) in view of Abbe et al. (US 3,159,507), as applied to claims 1-2 above, and further in view of Farahmandi et al. (US 2001/0020319).

The disclosure of Zucker and Abbe et al. as discussed above is fully disclosed herein.

With regard to claim 7, modified Zucker fails to specifically state that the welded joints can be bonded by spot-welding.

Farahmandi et al. teaches that spot welding and ultrasonic welding are two suitable bonding techniques (paragraph [0235]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of bonding via spot-welding of Farahmandi et al. to the bonding technique of modified Zucker because spot-welding is known to be an effective method of bonding and one would have a reasonable expectation of success in doing so.

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Furthermore, it is noted that the product-by-limitations of claim 7 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (*In re Thorpe*, 227 USPQ 964, 1985). Moreover, a product-by-process limitation is held to be obvious if the product is similar to a prior art product (*In re Brown*, 173 USPQ 685, and *In re Fessmann*, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Claim 7 as written does not distinguish the product of the instant application from the product of the prior art.

7. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zucker (WO 03/026038) in view of Abbe et al. (US 3,159,507), as applied to claim 16 above, and further in view of Kawai (JP 55-146872).

The disclosure of Zucker and Abbe et al. as discussed above is fully disclosed herein.

With regard to claim 17, modified Zucker fails to teach the concept of the fleece layer comprising a specified amount of glass fibers.

Kawai teaches the concept of a battery separator comprising a mixture of glass fibers and polyethylene fibers in a ratio of 70wt% of glass fiber and 30wt% of polyethylene fiber in order to prevent short circuit at the time of over discharge (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of having a separator comprise a mixture of glass fibers

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and polyethylene fibers in a ratio of 70wt% of glass fiber and 30wt% of polyethylene fiber of Kawai to the fleece layer of the separator of modified Zucker in order to produce a separator that prevents short circuit at the time of over discharge (abstract).

8. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zucker (WO 03/026038) in view of Abbe et al. (US 3,159,507), as applied to claim 20 above, and further in view of Bohnstedt et al. (US 2003/0129486).

The disclosure of Zucker and Abbe et al. as discussed above is fully disclosed herein.

With regard to claim 21, Zucker teaches bonding / welding / fusing the at least one planar fleece layer to the microporous sheet by ultrasonic welding / ultrasonic sealing (page 16, paragraph 2) and that the microporous sheet can have a number of protrusions / ribs, each defining an area of increased film thickness, on at least one face of a base sheet / first layer (page 11, paragraph 5 - page 12, line 2), but fails to teach that the planar fleece material is bonded to at least some of the protrusions / ribs via welded / fused joints on said protrusions / ribs or teach specifically state the height of the protrusions.

Abbe et al. teaches that the planar fleece material is bonded to at least some of the protrusions / ribs via welded / fused joints on said protrusions / ribs of the microporous sheet (col. 4, lines 10-12 & col. 5, lines 7-10; Figure 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of having the planar fleece material be bonded to at least

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some of the protrusions / ribs via welded / fused joints on said protrusions / ribs of the microporous sheet of Abbe et al. to the separator of Zucker because this is a known method of welding / bonding a planar fleece material to a microporous sheet and one would have a reasonable expectation of success in doing so.

Modified Abbe et al. fails to specifically state the height of the protrusions.

Bohnstedt et al. teaches the concept of a battery separator having ribs have a height of 0.3-1.3mm, and preferably about 0.5mm (paragraph [0019]) while the base thickness (separator thickness not including the protrusions) is 0.1-0.6mm (paragraph [0017]) in order to reliably maintain electrode distance during use and ensure electrical isolation of the electrode plates (paragraphs [0008] & [0012]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of having ribs of height 0.3-1.3mm, preferably about 0.5mm of Bohnstedt et al. to the separator of modified Zucker in order to reliably maintain electrode distance during use and ensure electrical isolation of the electrode plates (paragraphs [0008] & [0012]).

### **Response to Arguments**

#### **Claim Rejections - 35 USC § 103**

9. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Abbe et al. (US 3,159,507) in view of Zucker (WO 03/026038) on claims are withdrawn.

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10. Applicant's arguments with respect to claims 1-22, filed on October 26, 2009, have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLAIRE L. RADEMAKER whose telephone number is (571)272-9809. The examiner can normally be reached on Monday - Thursday, 8:00AM - 4:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/C. L. R./

Examiner, Art Unit 1795

/Dah-Wei D. Yuan/

Supervisory Patent Examiner, Art Unit 1795